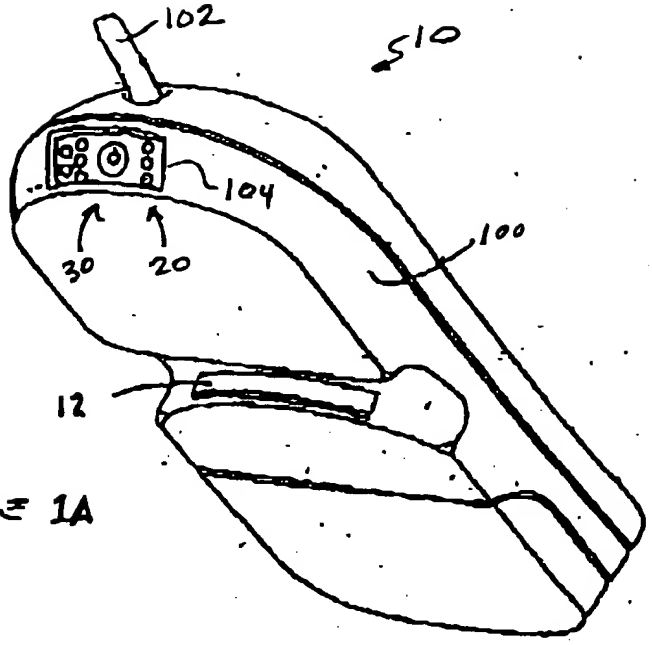

FIGURE 1A

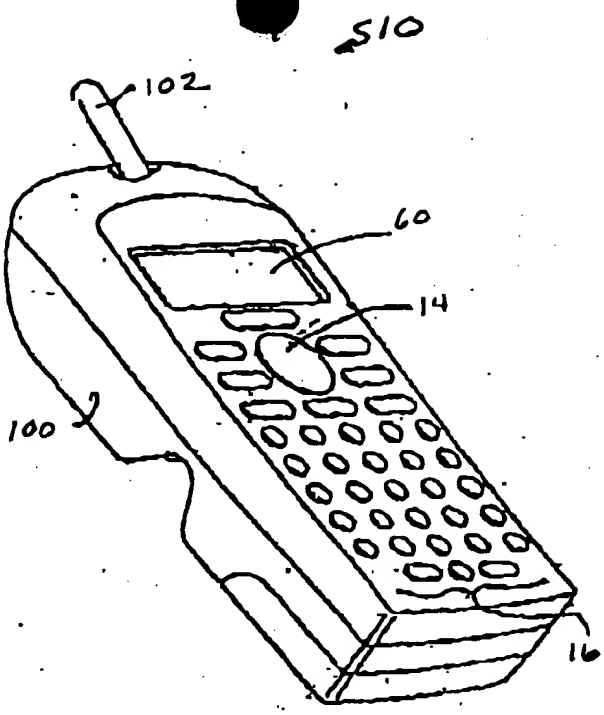

FIGURE 1B

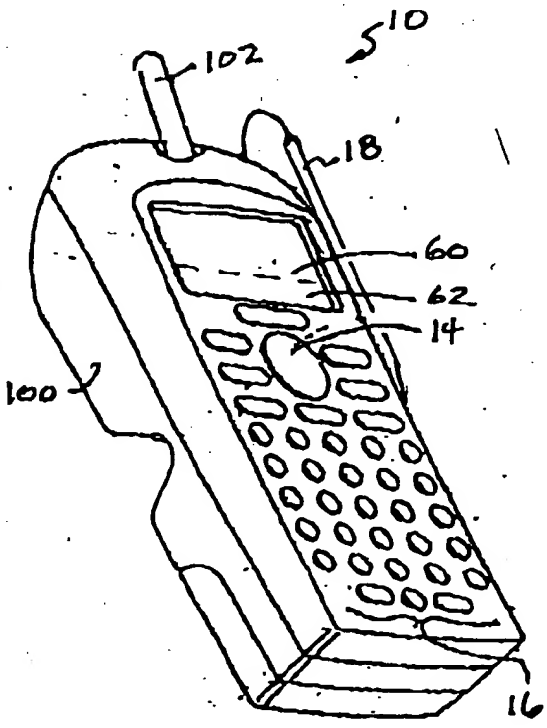

FIGURE 1C

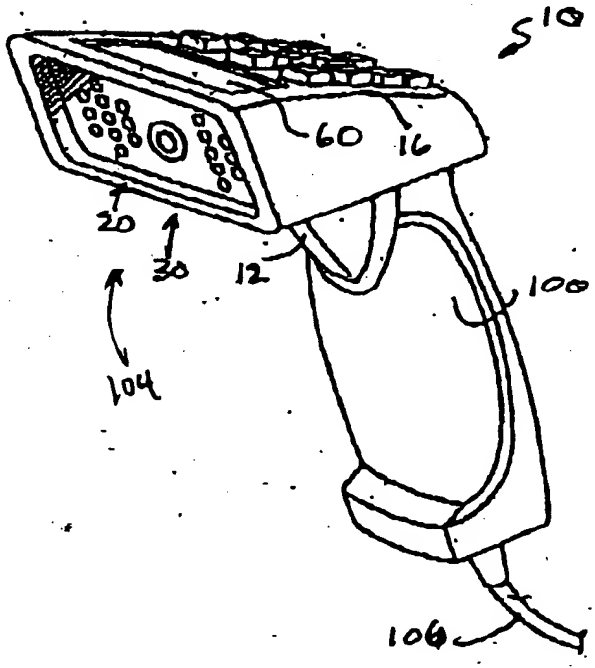

FIGURE 1D

FOCTZOT 20970060

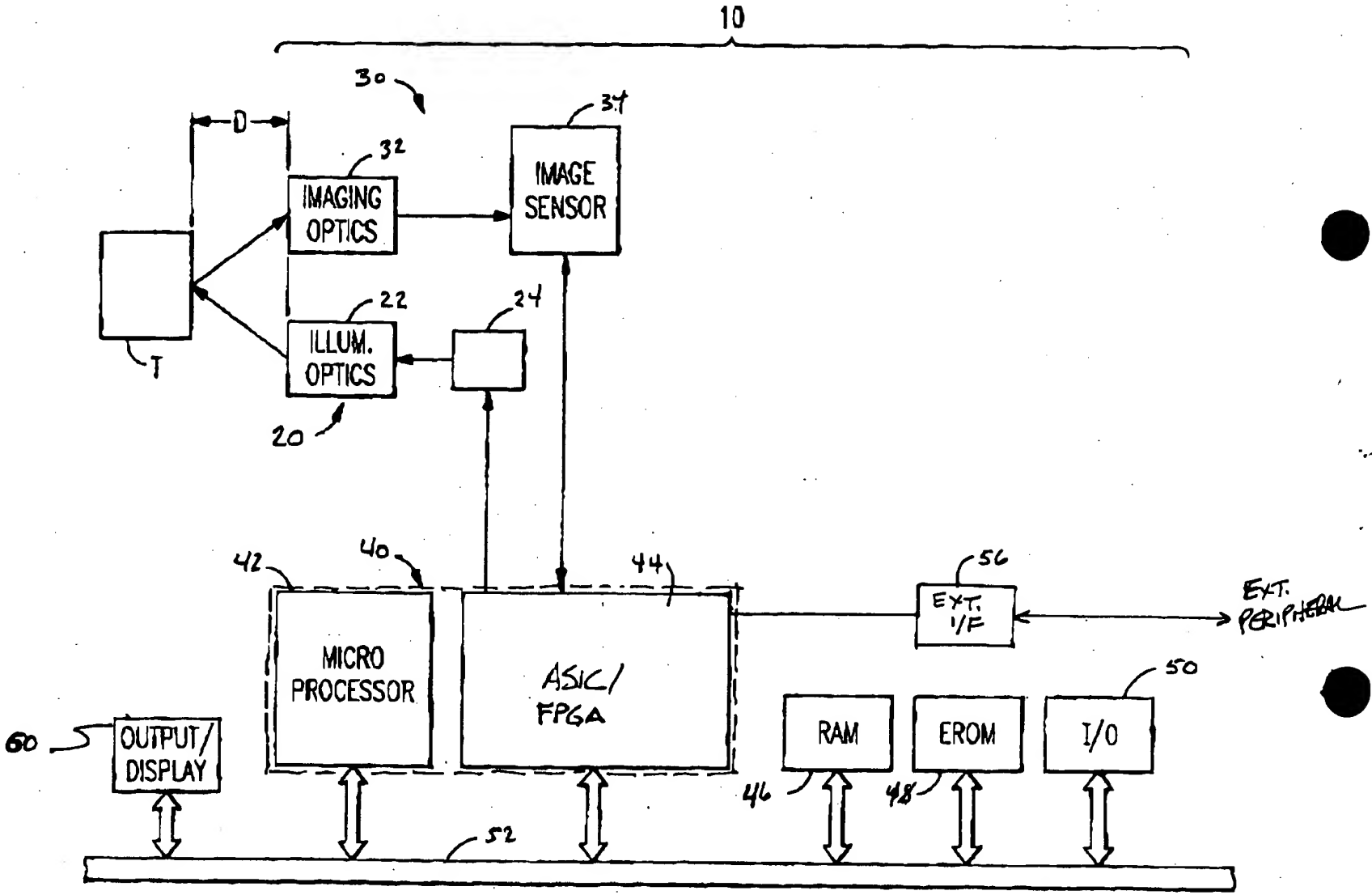

FIG.2

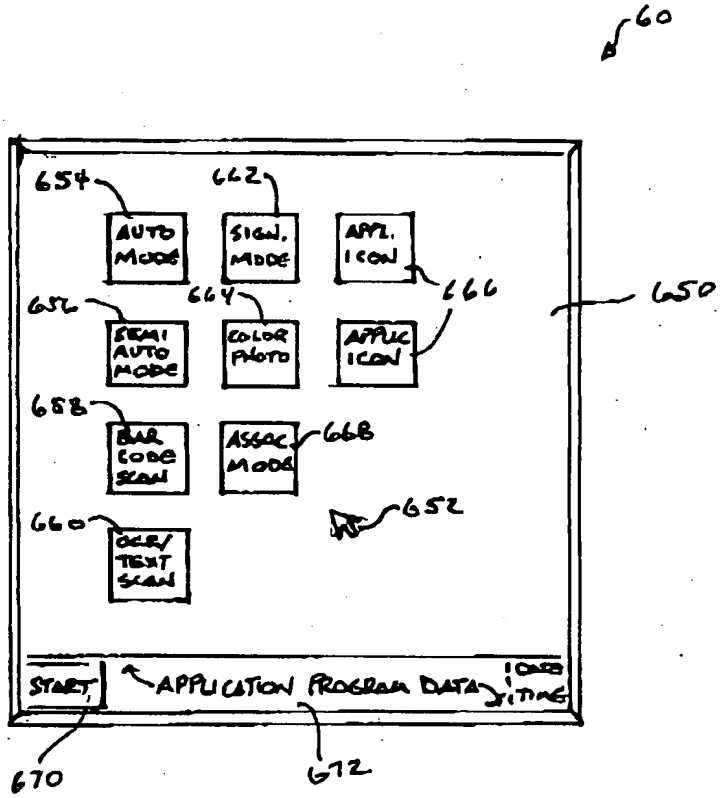
60
650
654
662
AUTO MODE
SIGN. MODE
APPL. ICON
656
664
666
SEMI AUTO MODE
COLOR PHOTO
APPLIC ICON
658
668
BAR CODE SCAN
ASSOC MODE
652
660
OCR/ TEXT SCAN
START
APPLICATION PROGRAM DATA
ICON SETTING
670
672

FIGURE 3

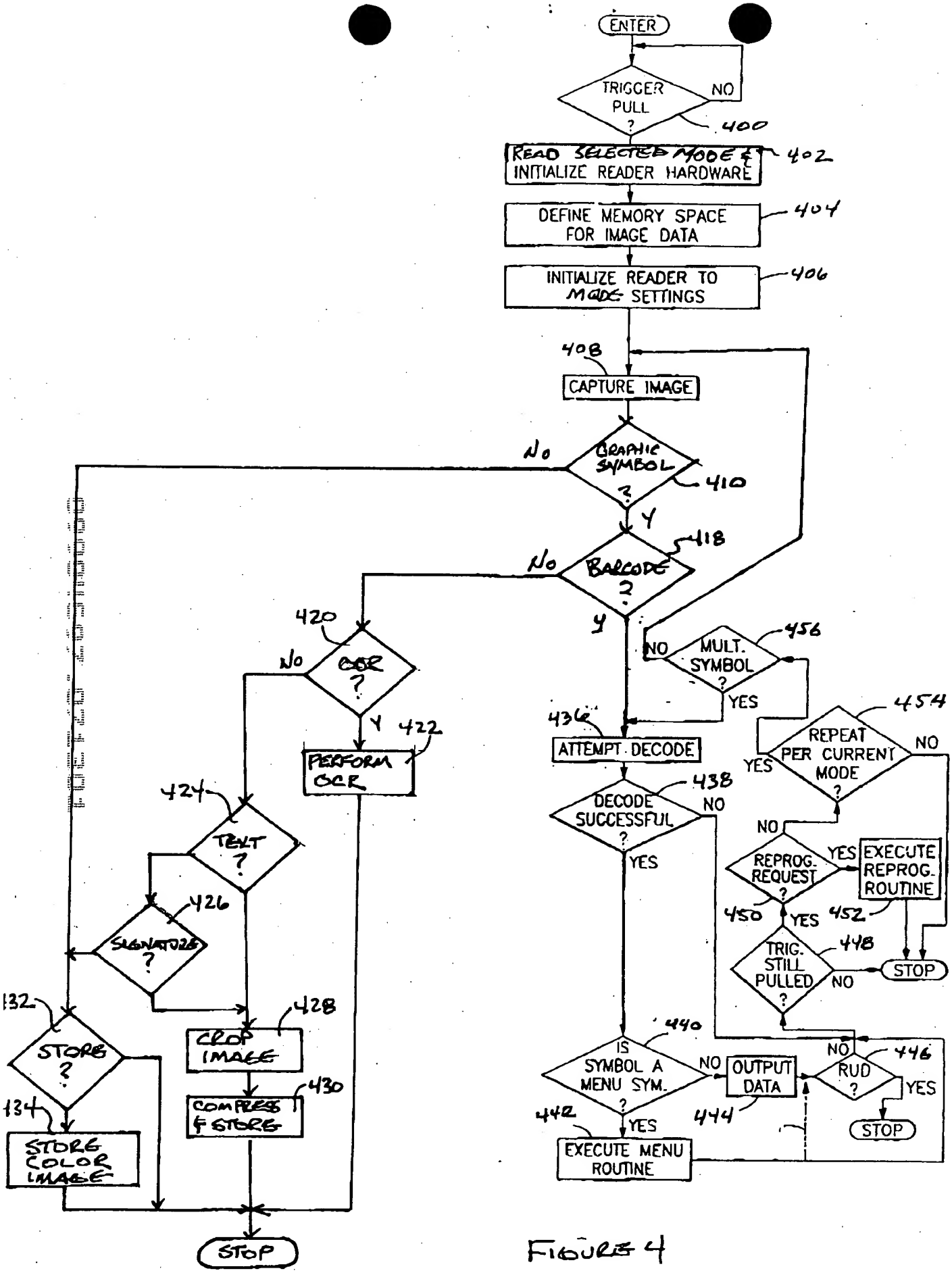
ENTER
TRIGGER PULL ?
NO
400
READ SELECTED MODE & INITIALIZE READER HARDWARE
402
DEFINE MEMORY SPACE FOR IMAGE DATA
404
INITIALIZE READER TO MODE SETTINGS
406
408
CAPTURE IMAGE
GRAPHIC SYMBOL ?
410
No
Y
BARCODE ?
418
No
Y
OCR ?
420
No
Y
PERFORM OCR
422
TEXT ?
424
SIGNATURE ?
426
STORE ?
132
CROP IMAGE
428
COMPRESS & STORE
430
STORE COLOR IMAGE
134
STOP
MULT. SYMBOL ?
456
NO
YES
ATTEMPT DECODE
436
DECODE SUCCESSFUL ?
438
NO
YES
REPEAT PER CURRENT MODE ?
454
YES
NO
REPROG. REQUEST ?
YES
NO
EXECUTE REPROG. ROUTINE
452
450
YES
TRIG. STILL PULLED ?
448
NO
STOP
IS SYMBOL A MENU SYM. ?
440
NO
YES
OUTPUT DATA
444
RUD ?
446
NO
YES
STOP
442
EXECUTE MENU ROUTINE

FIGURE 4

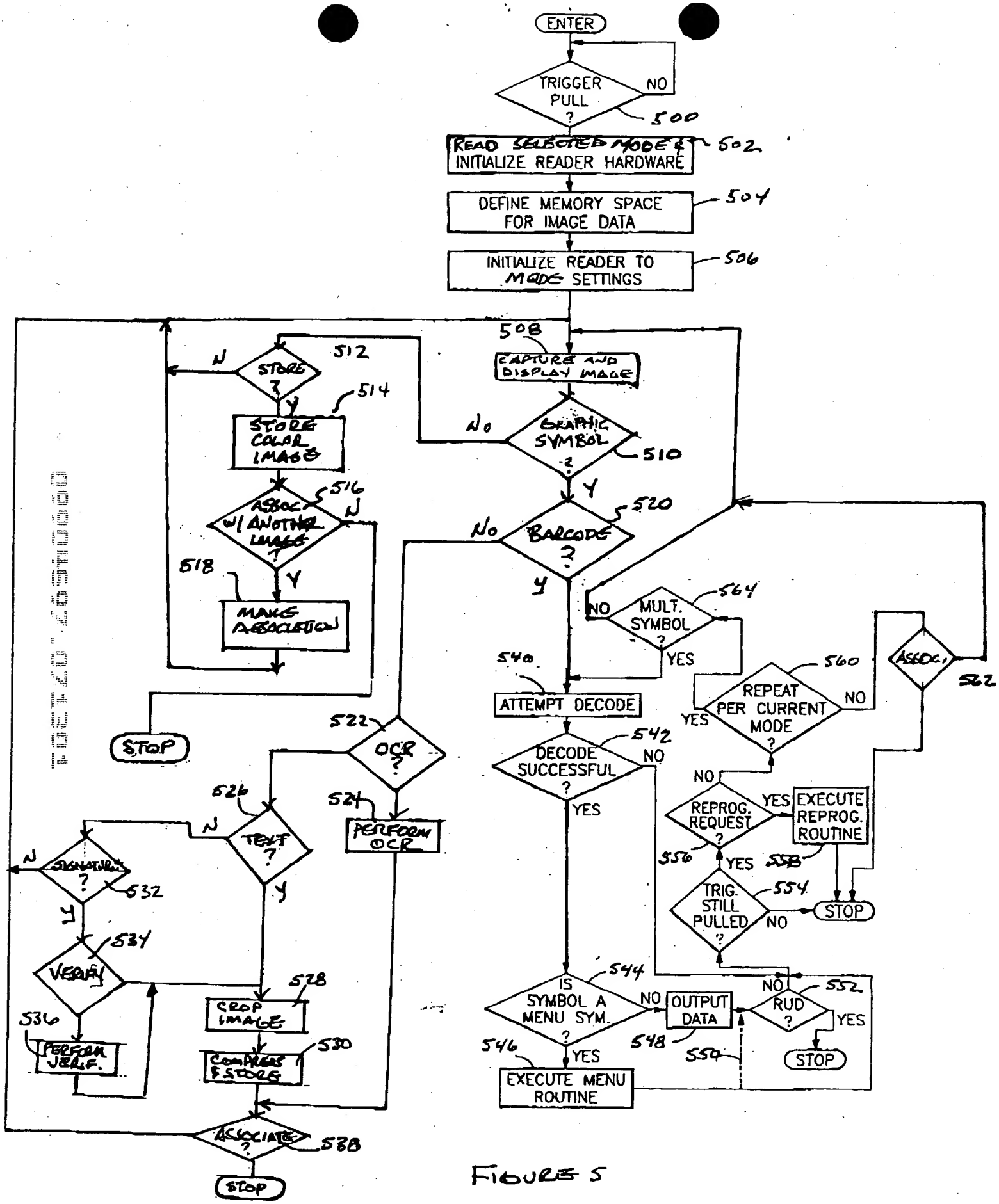
ENTER
TRIGGER PULL ?
NO
500
READ SELECTED MODE & INITIALIZE READER HARDWARE
502
DEFINE MEMORY SPACE FOR IMAGE DATA
504
INITIALIZE READER TO MODE SETTINGS
506
508
CAPTURE AND DISPLAY IMAGE
GRAPHIC SYMBOL ?
510
No
Y
BARCODE ?
520
No
Y
MULT. SYMBOL ?
564
NO
YES
ATTEMPT DECODE
540
DECODE SUCCESSFUL ?
542
NO
YES
REPEAT PER CURRENT MODE ?
560
NO
YES
ASSOC.
522
REPROG. REQUEST ?
YES
NO
EXECUTE REPROG. ROUTINE
558
556
YES
TRIG. STILL PULLED ?
554
NO
STOP
IS SYMBOL A MENU SYM. ?
544
NO
YES
OUTPUT DATA
548
RUD ?
552
NO
YES
STOP
546
EXECUTE MENU ROUTINE
550
OCR ?
522
PERFORM OCR
524
TEXT ?
526
N
Y
SIGNATURE ?
532
Y
VERIFY
534
PERFORM VERIF.
536
CROP IMAGE
528
COMPRESS & STORE
530
ASSOCIATE ?
538
STOP
STORE ?
512
N
Y
STORE COLOR IMAGE
514
ASSOC. W/ ANOTHER IMAGE ?
516
N
Y
MAKE ASSOCIATION
518
STOP

FIGURE 5

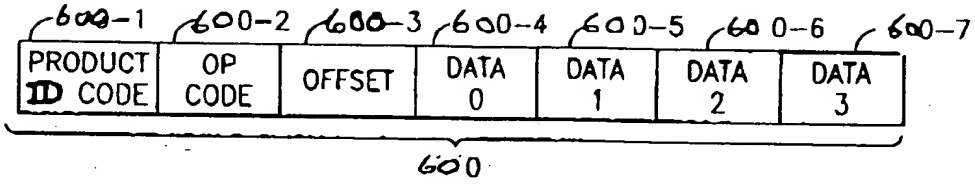

FIGURE 6A

OPTIONS (OFFSET) TABLE

A. COMMUNICATIONS OPTIONS
   1. RS-232
   2. BAUD RATE
   3. RF LINK
   4. ETHERNET
B. CODE OPTIONS
   1. DISABLE 1D
   2. DISABLE 2D
   3. DISABLE INDIV.
   4. MIN-MAX LENGTH
   5. MULTIPLE SYMBOLS ENABLED
C. SCANNING-DECODING OPTIONS
   1. ONE SHOT
   2. REPEAT UNTIL DONE
   3. REPEAT UNTIL STOPPED
   4. SCAN ON DEMAND
   5. SKIP SCAN
   6. DECODE ON DEMAND
D. OPERATING OPTIONS
   1. BEEPER VOLUME
   2. AIMING LED ON/OFF
   3. AURAL FEEDBACK
E. TRANSMIT OPTIONS
   1. SEND CHECK CHAR'S
   2. SEND CHECKSUM
   3. DATA EDIT OPTIONS

F. READER MODE OPTIONS
   1. Automatic
   2. Semi-Automatic
   3. Bar Code Scanning
   4. OCR
   5. Signature
   6. Color Imaging

FIGURE 6B

OP CODE TABLE

A. OP CODE "0"-VECTOR PROC.
   1. OUTPUT VERSION OF SOFTWARE
   2. OUTPUT CONTENTS OF PARAMETER TABLE
   3. DISPLAY ENABLED CODES
   4. PRINT PARAMETER TABLE AS BAR CODE SYMBOL
B. OP CODE "1" - CLEAR
C. OP CODE "2" - SET
D. OP CODE "3" - TOGGLE
E. OP CODE "4" - ADD
F. OP CODE "5" - DEFAULT
G. OP CODE "6" - LOAD
H. OP CODE "7" - RESERVED

FIGURE 6C

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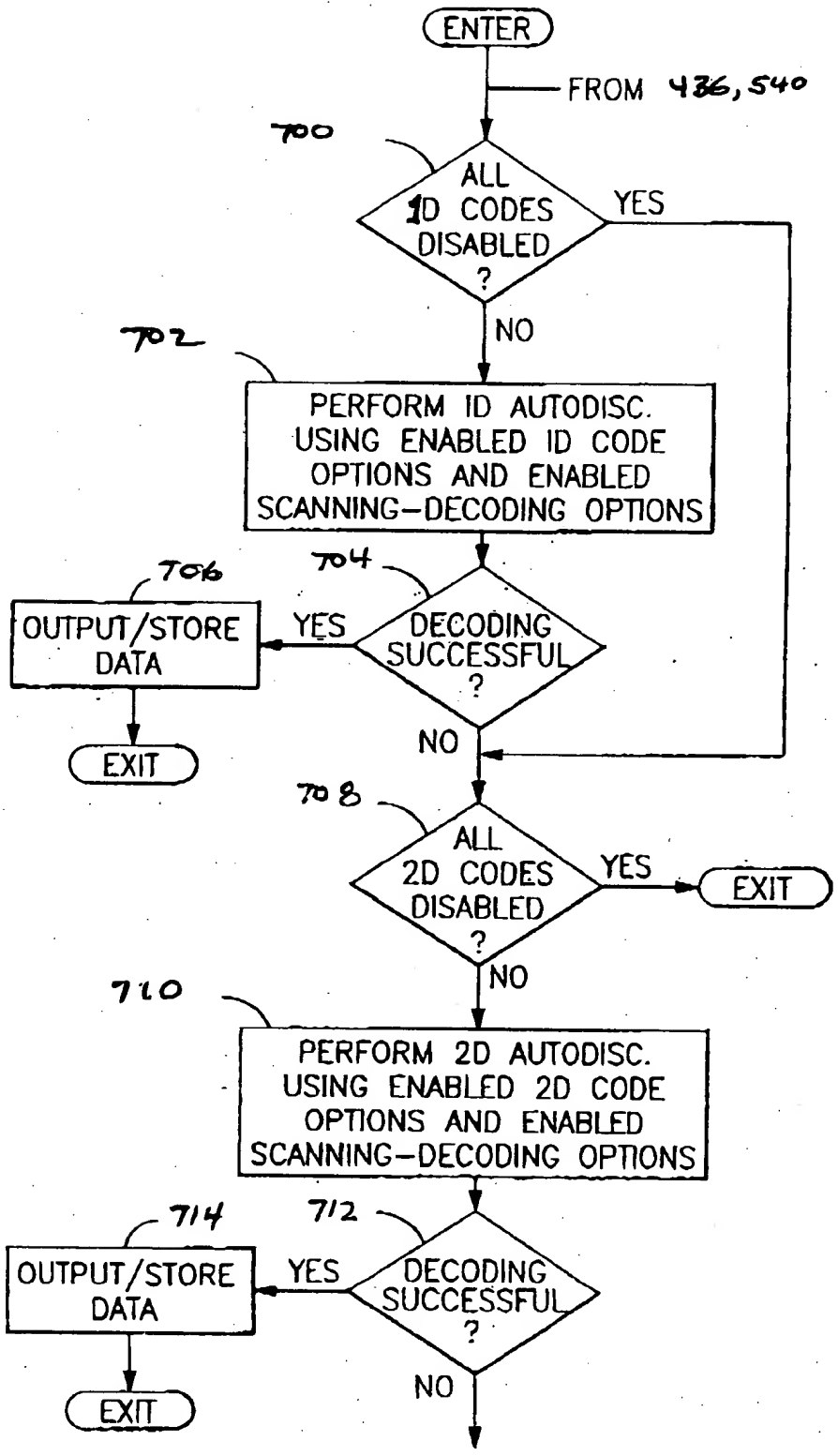
ENTER
FROM 436,540
700
ALL 1D CODES DISABLED ?
YES
NO
702
PERFORM 1D AUTODISC. USING ENABLED 1D CODE OPTIONS AND ENABLED SCANNING–DECODING OPTIONS
704
DECODING SUCCESSFUL ?
YES
706
OUTPUT/STORE DATA
EXIT
NO
708
ALL 2D CODES DISABLED ?
YES
EXIT
NO
710
PERFORM 2D AUTODISC. USING ENABLED 2D CODE OPTIONS AND ENABLED SCANNING–DECODING OPTIONS
712
DECODING SUCCESSFUL ?
YES
714
OUTPUT/STORE DATA
EXIT
NO

FIGURE 7

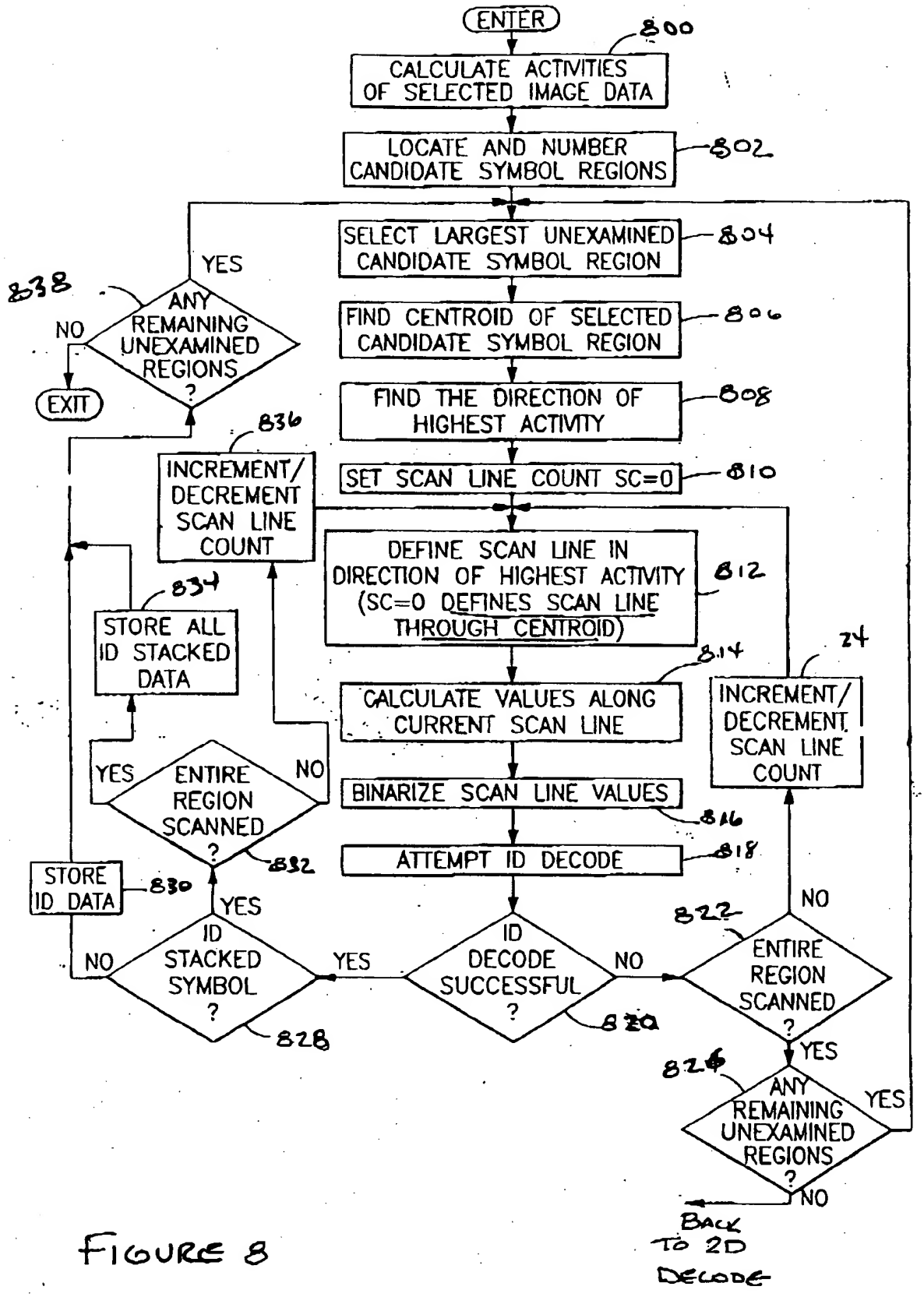
FROM 1D DECODE
ENTER
800
CALCULATE ACTIVITIES OF SELECTED IMAGE DATA
802
LOCATE AND NUMBER CANDIDATE SYMBOL REGIONS
804
SELECT LARGEST UNEXAMINED CANDIDATE SYMBOL REGION
806
FIND CENTROID OF SELECTED CANDIDATE SYMBOL REGION
808
FIND THE DIRECTION OF HIGHEST ACTIVITY
810
SET SCAN LINE COUNT SC=0
812
DEFINE SCAN LINE IN DIRECTION OF HIGHEST ACTIVITY (SC=0 DEFINES SCAN LINE THROUGH CENTROID)
814
CALCULATE VALUES ALONG CURRENT SCAN LINE
816
BINARIZE SCAN LINE VALUES
818
ATTEMPT ID DECODE
820
ID DECODE SUCCESSFUL ?
YES
NO
822
ENTIRE REGION SCANNED ?
YES
NO
824
ANY REMAINING UNEXAMINED REGIONS ?
YES
NO
BACK TO 2D DECODE
24
INCREMENT/ DECREMENT SCAN LINE COUNT
826
ID STACKED SYMBOL ?
YES
NO
828
STORE ID DATA
830
ENTIRE REGION SCANNED ?
YES
NO
832
STORE ALL ID STACKED DATA
834
INCREMENT/ DECREMENT SCAN LINE COUNT
836
ANY REMAINING UNEXAMINED REGIONS ?
YES
NO
838
EXIT

FIGURE 8

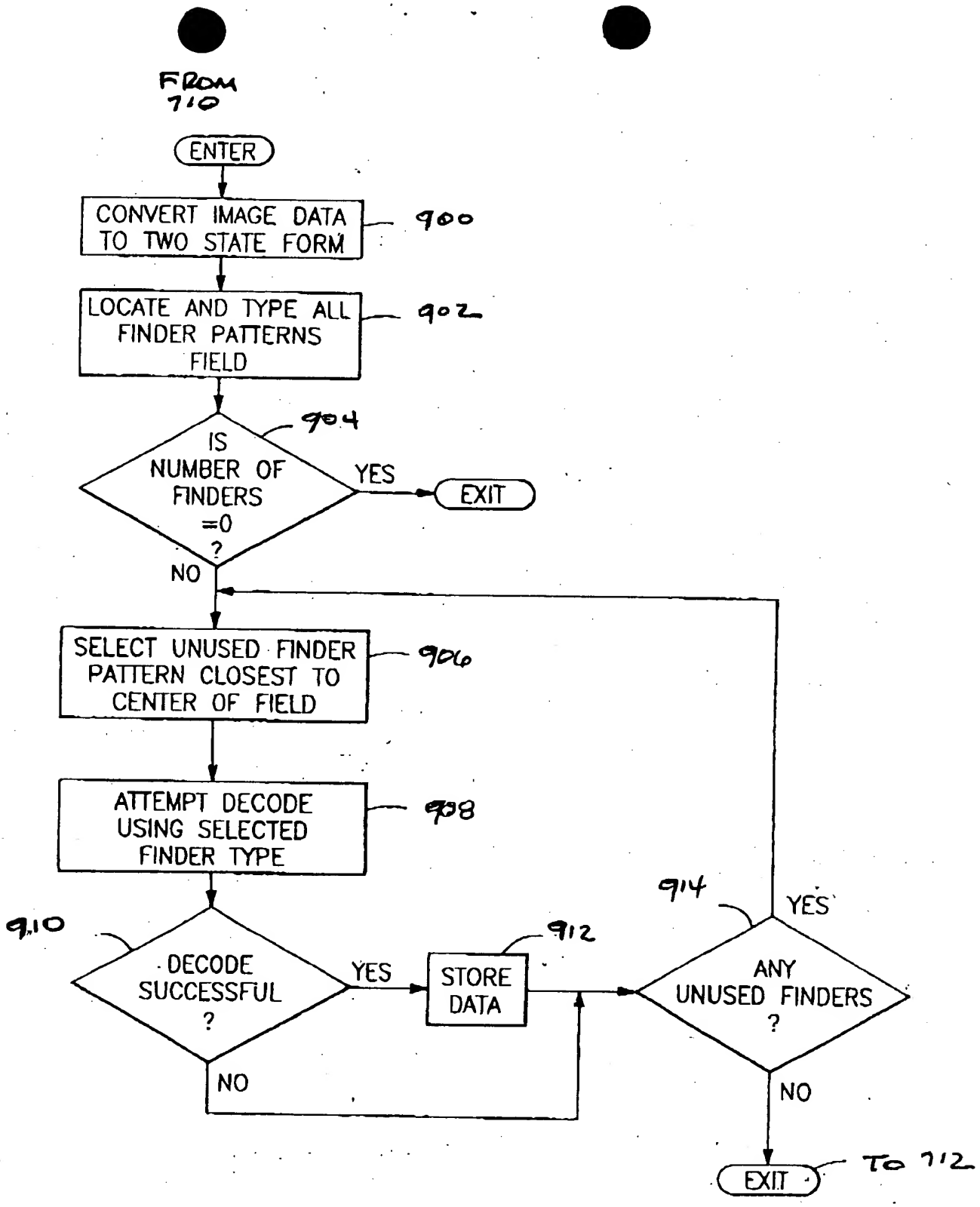
FROM 710
ENTER
CONVERT IMAGE DATA TO TWO STATE FORM
900
LOCATE AND TYPE ALL FINDER PATTERNS FIELD
902
IS NUMBER OF FINDERS =0 ?
904
YES
EXIT
NO
SELECT UNUSED FINDER PATTERN CLOSEST TO CENTER OF FIELD
906
ATTEMPT DECODE USING SELECTED FINDER TYPE
908
DECODE SUCCESSFUL ?
910
YES
STORE DATA
912
ANY UNUSED FINDERS ?
914
YES
NO
NO
EXIT
TO 712

FIGURE 9

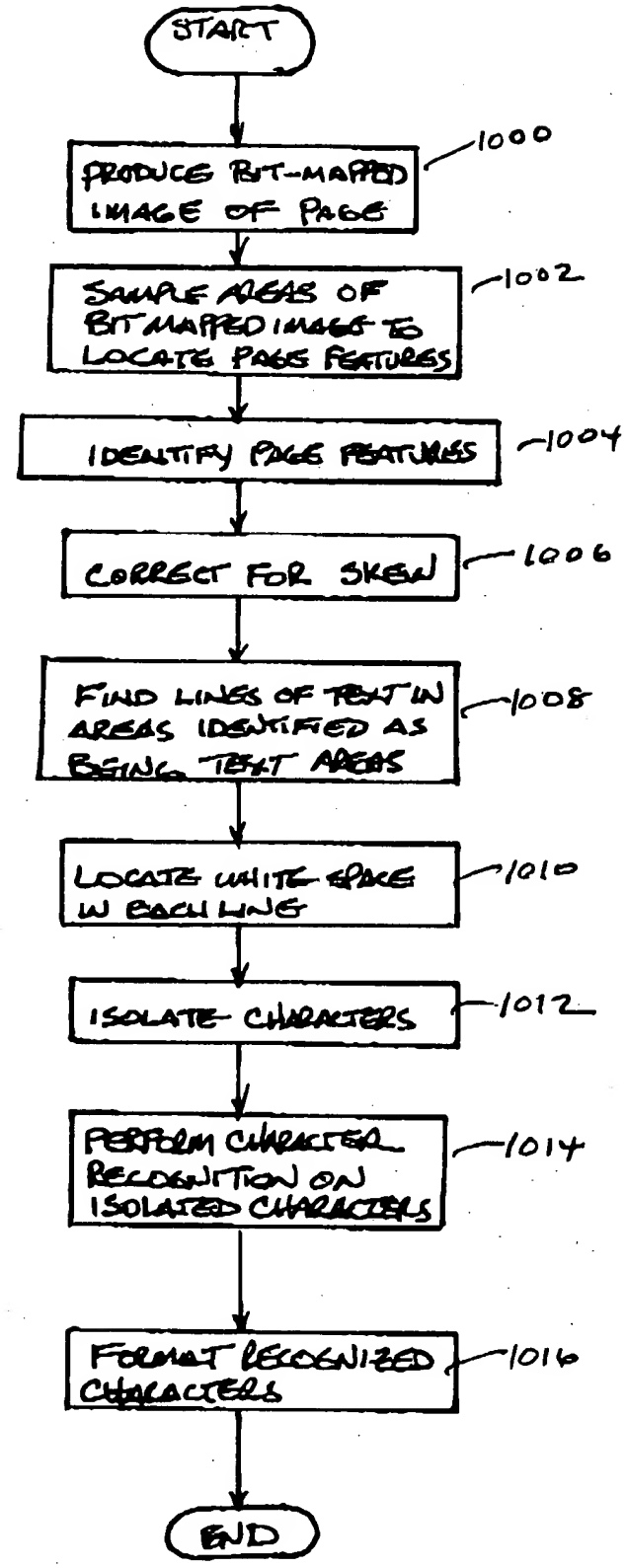
START
PRODUCE BIT-MAPPED IMAGE OF PAGE
1000
SAMPLE AREAS OF BIT MAPPED IMAGE TO LOCATE PAGE FEATURES
1002
IDENTIFY PAGE FEATURES
1004
CORRECT FOR SKEW
1006
FIND LINES OF TEXT IN AREAS IDENTIFIED AS BEING TEXT AREAS
1008
LOCATE WHITE SPACE IN EACH LINE
1010
ISOLATE CHARACTERS
1012
PERFORM CHARACTER RECOGNITION ON ISOLATED CHARACTERS
1014
FORMAT RECOGNIZED CHARACTERS
1016
END

FIGURE 10

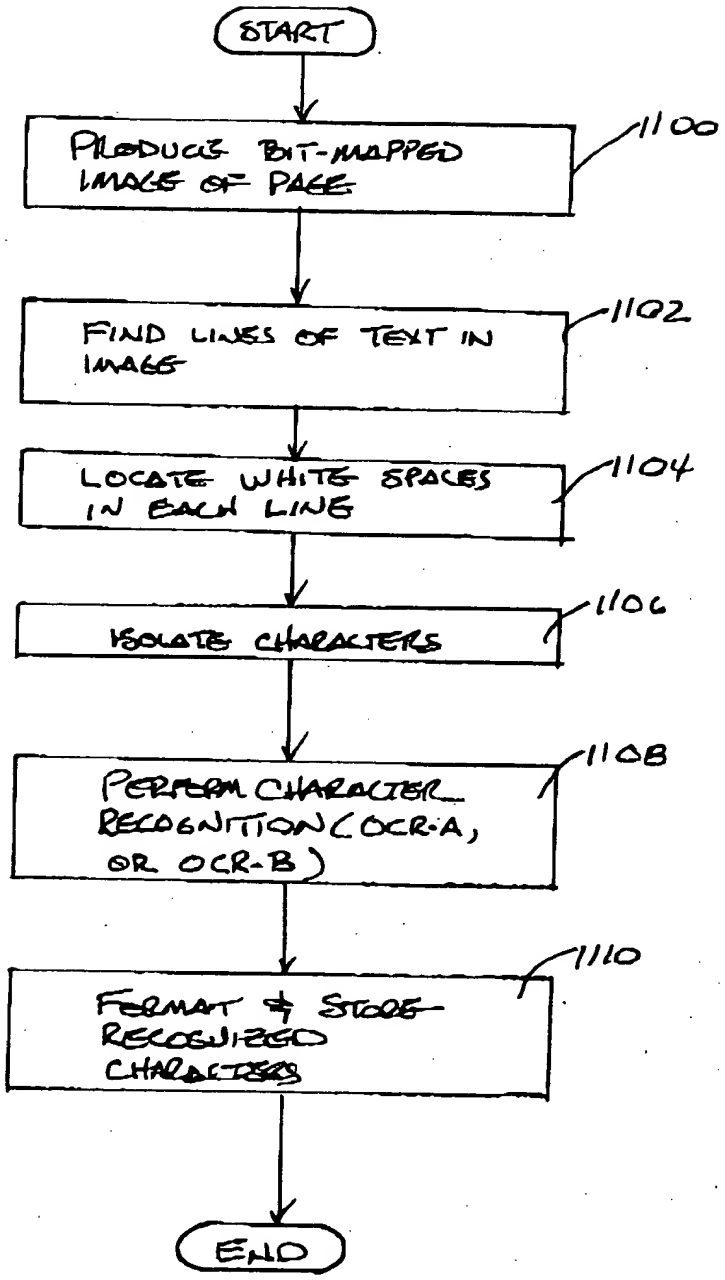
START
PRODUCE BIT-MAPPED IMAGE OF PAGE
1100
FIND LINES OF TEXT IN IMAGE
1102
LOCATE WHITE SPACES IN EACH LINE
1104
ISOLATE CHARACTERS
1106
PERFORM CHARACTER RECOGNITION (OCR-A, OR OCR-B)
1108
FORMAT & STORE RECOGNIZED CHARACTERS
1110
END

FIGURE 11

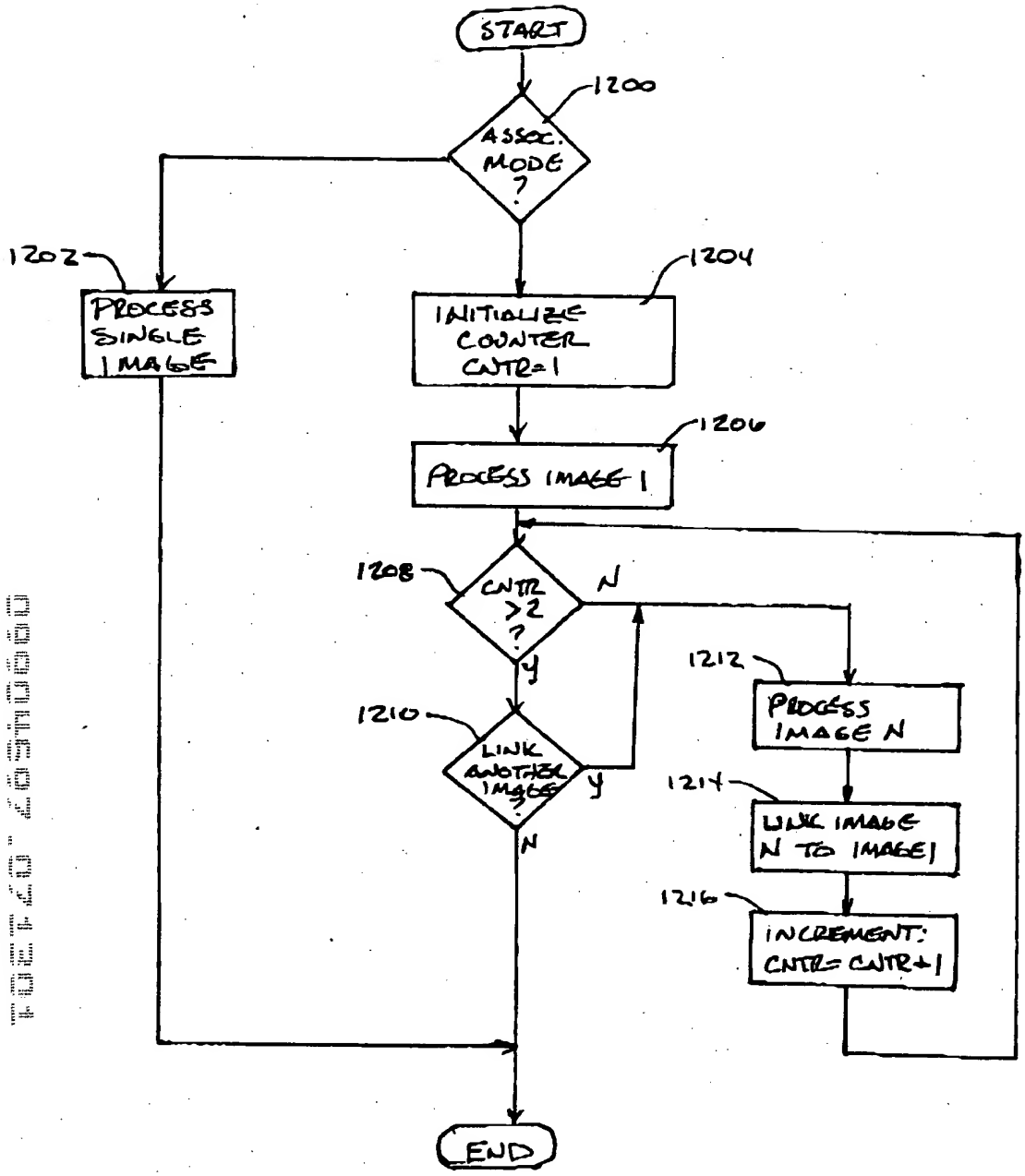
START
1200
ASSOC. MODE ?
1202
PROCESS SINGLE IMAGE
1204
INITIALIZE COUNTER CNTR=1
1206
PROCESS IMAGE 1
1208
CNTR >2 ?
N
Y
1210
LINK ANOTHER IMAGE ?
Y
N
1212
PROCESS IMAGE N
1214
LINK IMAGE N TO IMAGE 1
1216
INCREMENT: CNTR= CNTR+1
END

FIGURE 12

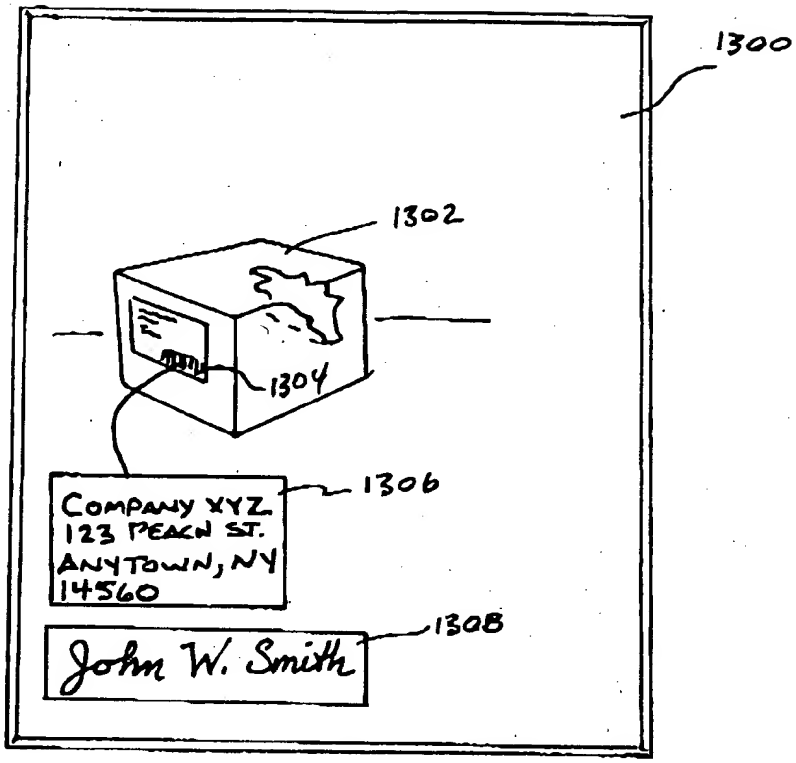
1300
1302
1304
1306
COMPANY XYZ.
123 PEACH ST.
ANYTOWN, NY
14560
1308
John W. Smith

FIGURE 13

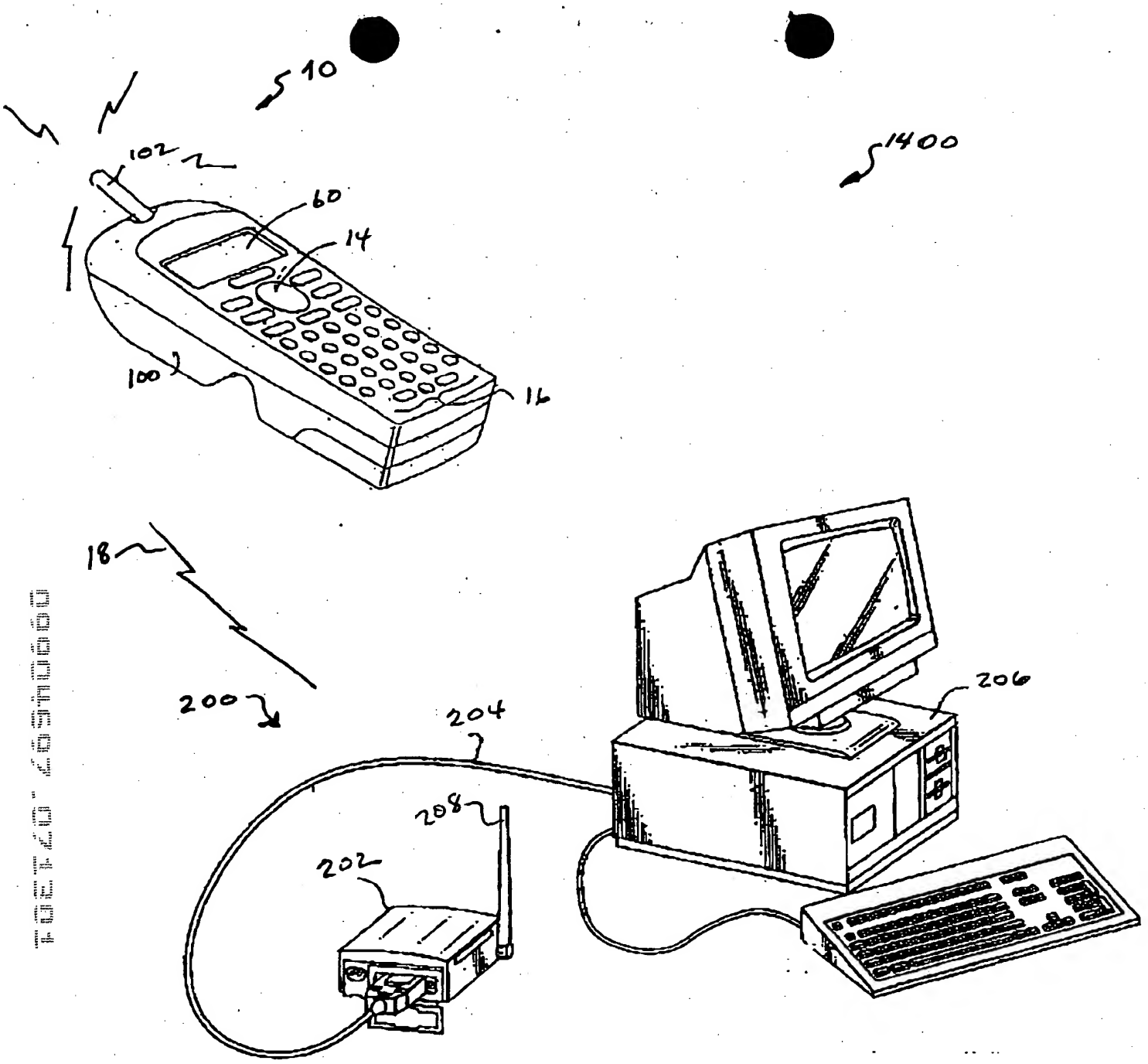

FIGURE 14

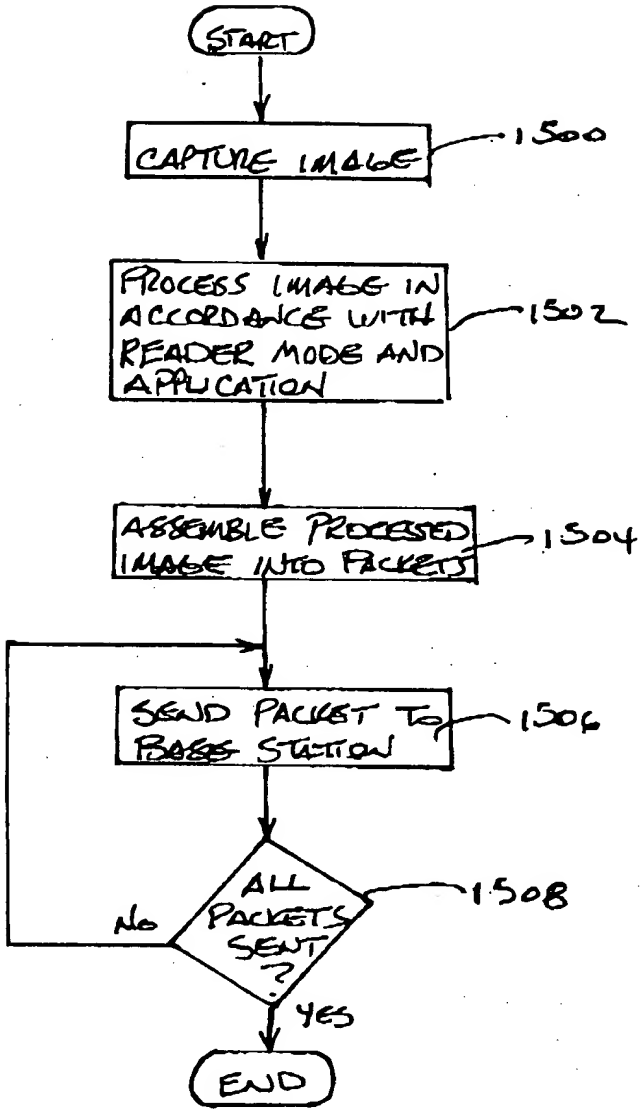
START
CAPTURE IMAGE
1500
PROCESS IMAGE IN ACCORDANCE WITH READER MODE AND APPLICATION
1502
ASSEMBLE PROCESSED IMAGE INTO PACKETS
1504
SEND PACKET TO BASE STATION
1506
ALL PACKETS SENT ?
1508
No
YES
END

FIGURE 15

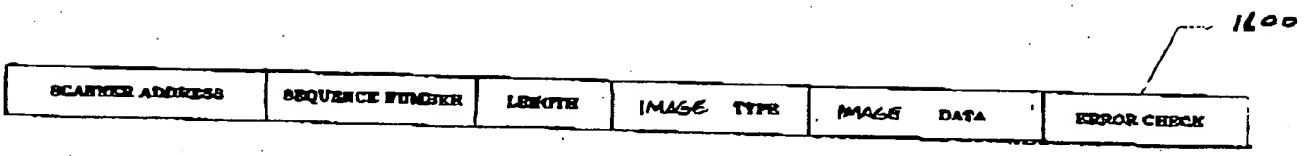

FIGURE 16A

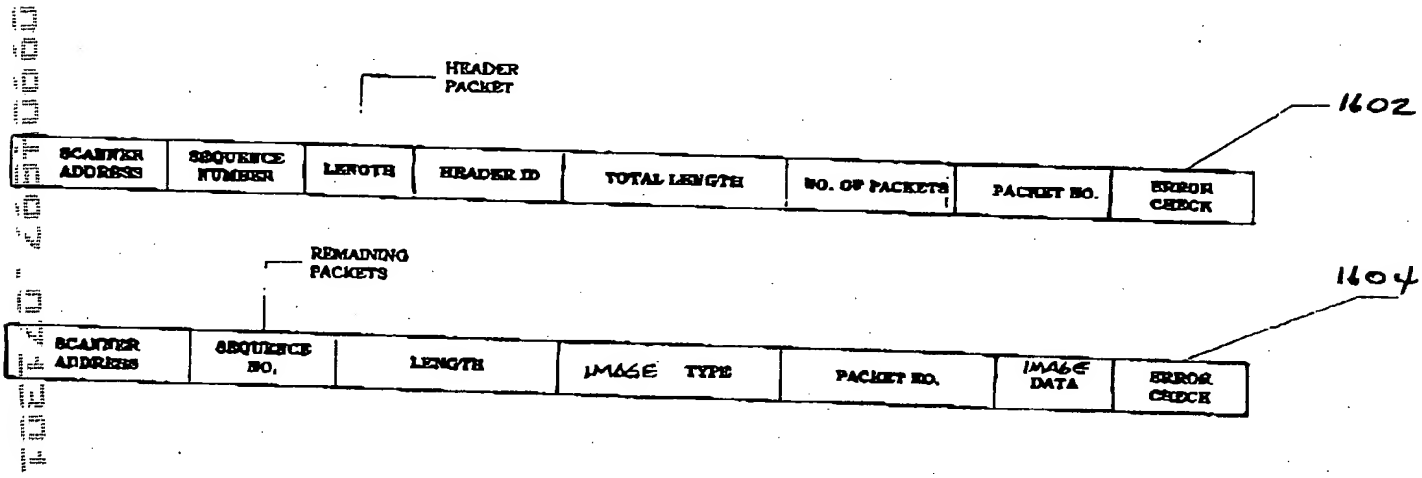

FIGURE 16B

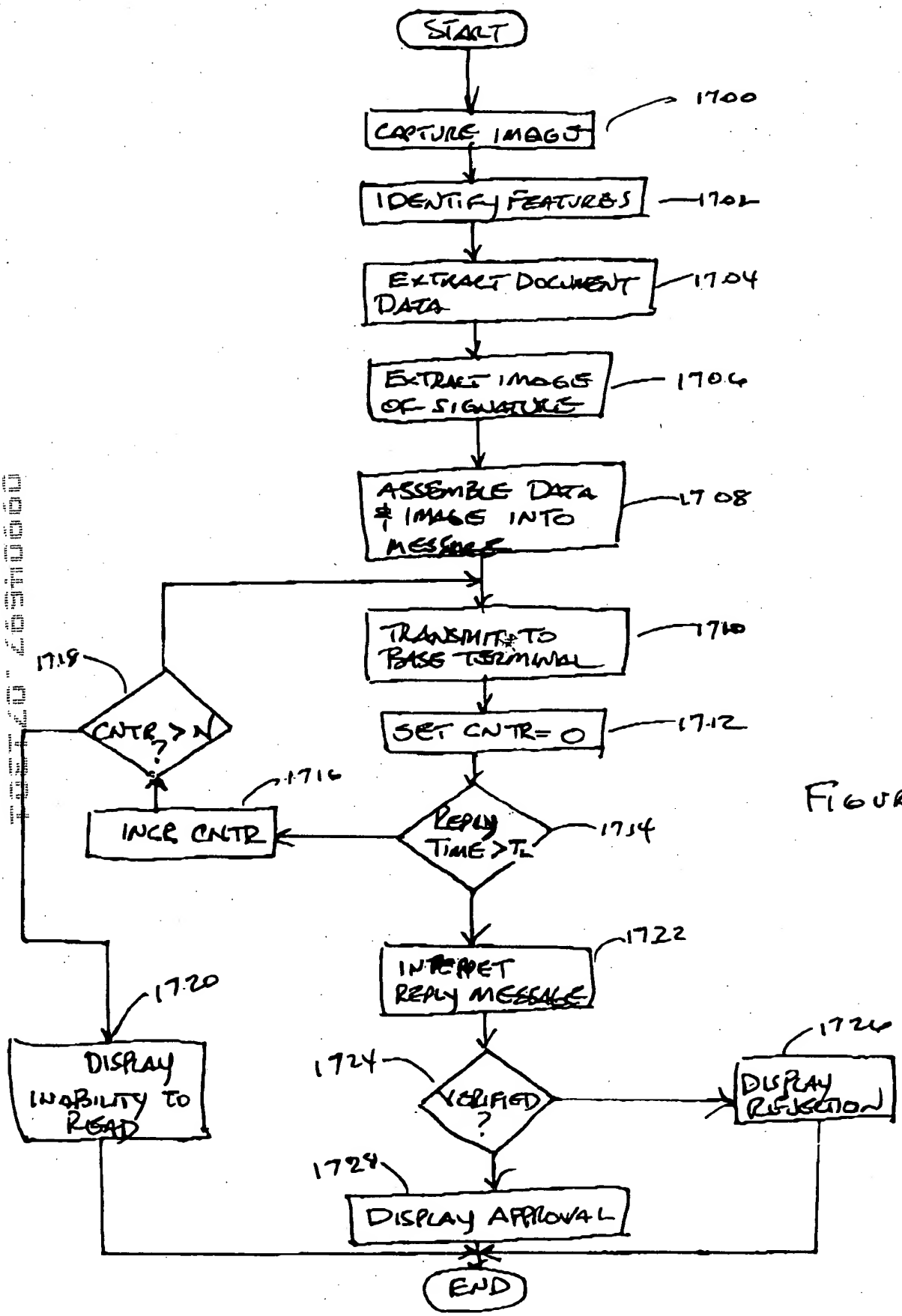
START
CAPTURE IMAGE
1700
IDENTIFY FEATURES
1702
EXTRACT DOCUMENT DATA
1704
EXTRACT IMAGE OF SIGNATURE
1706
ASSEMBLE DATA & IMAGE INTO MESSAGE
1708
TRANSMIT TO BASE TERMINAL
1710
SET CNTR = 0
1712
REPLY TIME > T_L
1714
INCR CNTR
1716
CNTR > N ?
1718
DISPLAY INABILITY TO READ
1720
INTERPRET REPLY MESSAGE
1722
VERIFIED ?
1724
DISPLAY REJECTION
1726
DISPLAY APPROVAL
1728
END

FIGURE 17

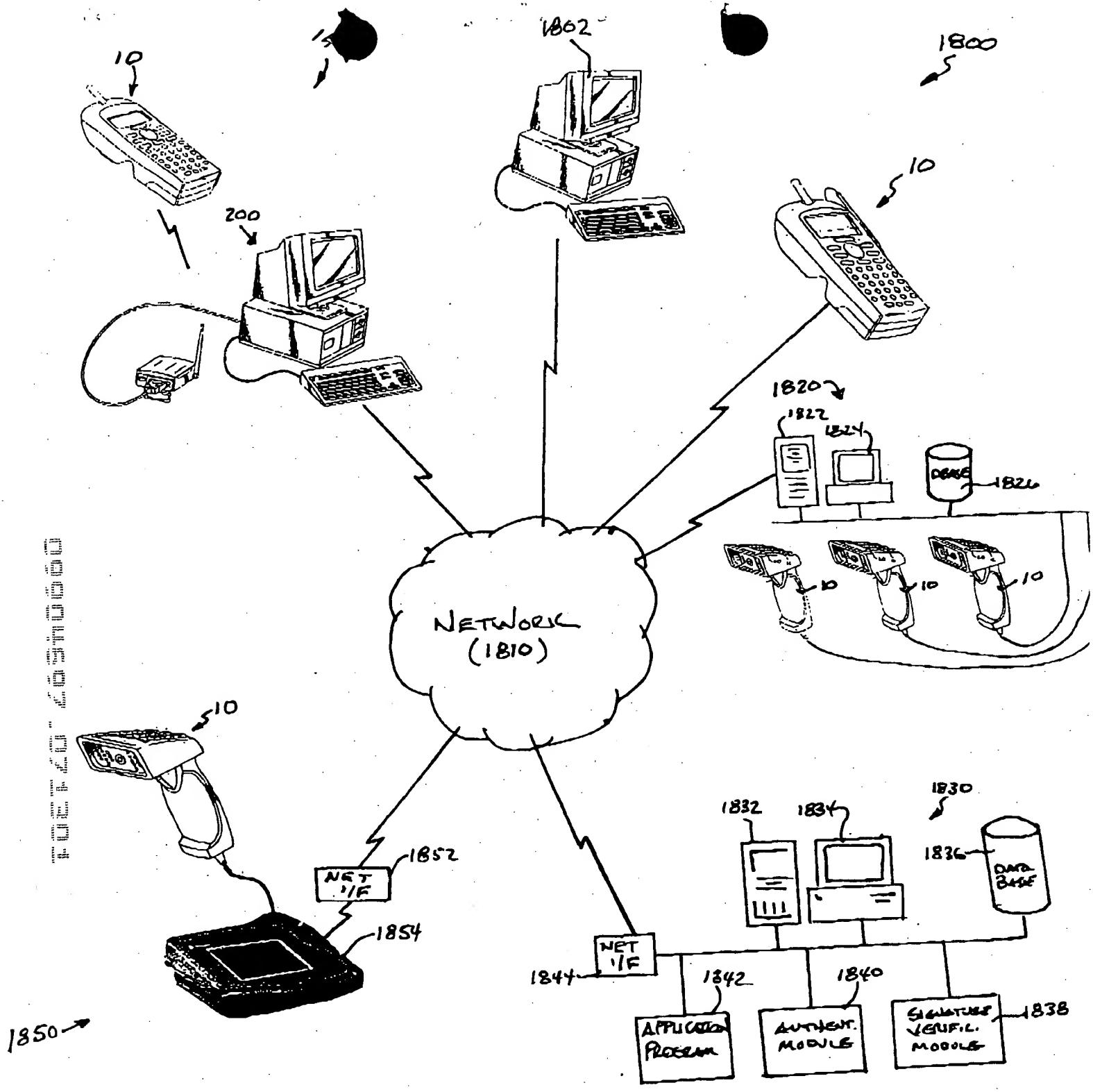
1800
1802
10
200
10
1820
1822
1824
1826
10
10
10
NETWORK
(1810)
10
1852
NET I/F
1854
1850
1830
1832
1834
1836
DATA BASE
1844
NET I/F
1842
1840
1838
APPLICATION PROGRAM
AUTHENT. MODULE
SIGNATURE VERIFI.C. MODULE

FIGURE 18